## NOTES ON THE BOTANY OF THE INTERIOR OF NEW SOUTH WALES.

By R. H. CAMBAGE, L.S.

(Plate xl., fig. 4.)

PART II .- FROM COBAR TO THE BOGAN RIVER ABOVE NYNGAN.

Leaving Cobar, and taking the road south-easterly towards Nymagee, it is found that for about 4 miles most of the timber has been removed owing to settlement in connection with the gold and copper mining carried on in the neighbourhood. Then the following trees are noticed:—

Encalyptus intertexta (Gum or Coolabah), E. populifolia (Bimble Box), E. viridis (Whipstick Mallee), Apophyllum anomalum (Currant or Warrior Bush), Capparis Mitchelli (Wild Orange), Canthium oleifolium (Lemon Bush), Geijera parviflora (Wilga), Eremophila Mitchelli (Budtha), Acacia excelsa (Ironwood), A. aneura (Mulga), and Callitris robusta (White Pine).

After passing the road which turns off to Gilgunnia there are Eucalyptus oleosa (a Mallee), Acacia homalophylla (Yarran), A. Oswaldi (Miljee or Little Ironwood), Hakea leucoptera (Needlewood), Heterodendron oleafolium (Rose Bush), Eremophila latifolia (a shrub called Tea Bush north of Cobar, and a useful fodder plant), Fusanus acuminatus (Quandong), Acacia doratoxylon (Currawong), Eucalyptus dumosa (White Mallee)—belts of Yarran on the flats and Mallee on the ridges—and Casuarina Cambagei (Belah).

At about 22 miles "The Rookery" is reached, near which place is a considerable quantity of limestone. From this point to the Restdown Gold Mines, a distance of about 10 miles, and

still on the road from Cobar to Nymagee, there are Acacia Oswaldi, A. homalophylla, Canthium oleifolium, Eucalyptus populifolia, Apophyllum anomalum (Currant Bush, of whose fruits bronzewing pigeons and emus are fond).

Here and elsewhere was noticed a shrub up to 6 and 8 feet high, in general appearance much like *Eremophila Mitchelli* (Budtha), but always growing in shrub-form, with sticky leaves. It was collected in various places between Bourke and Nymagee, but owing to the season of the year (May and June) no specimen was obtained that would enable the plant to be identified.

Other trees passed were—Pittosporum phillyraoides (Berrigan or Little Whitewood), Geijera parviflora (Wilga), Eucalyptus oleosa, and E. intertexta (Gum). Wherever this last-named tree grows it can be readily identified at a distance by its pale foliage and white limbs. In going west in the train this species is first sighted a few miles on the Dubbo side of Nyngan, and thereafter is generally in view till the river soil of the Darling is reached at about 20 miles from Bourke. It seems to avoid what is known as river country and grows only in the dryer parts. Near Girilambone I have known it mistaken for E. melliodora, A. Cunn., (Yellow Box), chiefly owing to the colour and smoothness of the bark on the upper part of the trunks, but with a little practice the two species can be separated by the foliage alone. E. melliodora does not grow at Girilambone so far as I know. In the colour of the sap and of the wood there is a distinct difference.

Next in order were—Eremophila Mitchelli, Hakea leucoptera, Heterodendron oleæfolium, Acacia colletioides, Cassia eremophila, Acacia aneura, Exocarpus aphylla, Fusanus acuminatus, Casuarina Cambagei (still with pale branchlets), Acacia hakeoides, Eucalyptus dumosa, Capparis Mitchelli, Eucalyptus Morrisii (a Mallee, on a pebbly hill growing with Acacia doratoxylon and A. decora), Callitris robusta, Helichrysum Cunninghamii (a shrub), Eucalyptus viridis, Dodonaa viscosa, var. attenuata, Myoporum deserti, and a mallee scrub of Eucalyptus oleosa, E. dumosa, and E. viridis.

Leaving the Nymagee road, and turning north-easterly from the Restdown Mines to Mount Boppy, a distance of about 20 miles, we first have about 2 miles of mallee scrub made up of Eucalyptus oleosa, E. dumosa, and E. viridis. It is in such places as this that the Mallee Hen (Leipoa ocellata, Gould) scratches up a mound of loose earth, 3 or 4 feet high and 12 to 15 feet in diameter, in which she lays her eggs in the spring, leaving them to be hatched by the heat of the sun. I am informed that when the young emerge from the shell, they at once start to scratch, feet uppermost; the effect being that the dust accumulates under their backs, and they are gradually raised to the surface of the mound, when they are at once ready to run off.

After passing the mallee there are—Callitris robusta, Apophyllum anomalum, Acacia doratoxylon, A. colletioides, A. aneura, Myoporum deserti, Fusanus acuminatus, Bertya Cunninghamii, Planch., (Broom Bush), Bossiaa sp. (locally known as Stick Bush; no flowers were procurable), Capparis Mitchelli, Acacia homalophylla, Eucalyptus populifolia, E. intertexta, Hakea leucoptera, Acacia hakeoides, Heterodendron oleafolium (locally called Apple Bush, though in most places it is known as Rosewood), Acacia Burkittii, Cassia eremophila, Eremophila longifolia, Canthium oleifolium, Geijera parviflora, Acacia decora, and A. excelsa.

At about 9 or 10 miles is the "Mulga Tank," so named because Acacia aneura (Mulga) grows near. This tree is not a strongly represented local species, its habitat being chiefly northerly of a line joining Cobar and Nyngan; still it is to be found in places much south of this, as my notes will show.

Passing on towards Mount Boppy there are—Helichrysum Cunninghamii, Acacia Oswaldi, Sterculia diversifolia (some very large trees), Acacia homalophylla, Hakea leucoptera, Fusanus acuminatus, Capparis Mitchelli, Acacia hakeoides, A. decora, Eremophila latifolia, Eucalyptus populifolia, E. interterta, E. viridis, and E. Morrisii.

About here *E. viridis* is noticed growing with only one stem a foot in diameter, and up to 40 and 50 feet high, though it

commonly assumes the mallee-form. E. Morrisii is found taking the highest ridges.

Turing south-easterly from the gold mines near Mount Boppy, through Geweroo and Trowell Creek stations to the Nyngan and Nymagee road, we pass Acacia excelsa, Callitris robusta, Eremophila Mitchelli, and Tecoma australis, R.Br., a climber often called Bignonia, with a beautiful white bell-shaped flower. In the month of May this creeper is in full flower, spreading over the trees on the ridges, and has a most attractive appearance.

Near here are hills of igneous formation, the first so far noticed, and it is interesting to mark any change in the vegetation.

On a ridge of quartz felspar porphyry we expect to find Eucalyptus Morrisii, as it has been found in all similar situations on hills of sedimentary origin. However, we look here in vain, but in its place is E. dealbata, A. Cunn. This is the most northwesterly locality in which I have ever found this species. There has been some difference of opinion among botanists as to whether this is a distinct species or only a western form of E. tereticornis. My observations are that E. tereticornis grows all along the coast north and south of Sydney, and that typical trees extend westerly, missing the higher Triassic sandstone of the Blue Mountains, but occurring again on the Devonian, Silurian, and igneous formations, in various situations on high and low land, but chiefly good soil, right out to Orange. After passing Molong, it is usually confined to the valleys. Here E. dealbata makes its appearance, on hills of Devonian sandstone, and this tree continues right out to Mount Hope, and possibly beyond, capping hills of Devonian sandstone and quartzite, Silurian slate, and igneous formation with considerable impartiality, but invariably taking the high land. It has an extensive range north and south. Where the formation is granite one of the species is sure to be represented.

E. tereticornis follows for some distance keeping the low land, but ceases long before E. dealbata. The former is known as Forest Red Gum, and the latter as Mountain and Cabbage Gum, though this last name is more often applied to E. hamastoma, Sm., a white brittle gum which grows on the Silurian slate ridges

about Bathurst and Orange, &c., where it is also called Brittle Gum and Brittle Jack. In general appearance *E. tereticornis* and *E. dealbata* are wonderfully alike, both in bark and foliage, even in detail. The woods are also very similar, though that of *E. dealbata* is softer, and not considered so lasting; still this is often attributed to the fact that one grows on a good flat, and the other on a ridge with shallow soil.

E. dealbata is the smaller tree, and out west will often grow in mallee-form—that is, with 8 or 10 stems from one root, and from 12 to 15 feet high, though it never forms extensive scrubs like typical mallee, and the wood is not so tough.

The opercula of E. tereticornis are generally long and pointed, but in E. dealbata they present more variation than those of most Eucalypts, being sometimes quite pointed, and at others almost hemispherical, varying in length from about half an inch to two Taking the fruits of E. tereticornis, it is found that they are pedicellate and domed, while those of E. dealbata are almost sessile and truncate, and therein, together with a difference in the opercula, seem to lie the chief distinguishing marks; yet in the districts where both trees grow it is undeniable that these conditions to some extent seem to graduate from one to the other. as it is possible to find trees with fruits both sessile and domed. Ignoring intermediate stages, and taking E. tereticornis of Parramatta on the one hand, and E. dealbata of Nymagee on the other. it would be at once concluded these were two different species. The idea suggested by this hypothesis is that possibly they are actually distinct, and only appear to graduate from one to the other when growing in the same neighbourhood. Apart from the fruits, and viewing the trees in the field where both grow, it seems quite impossible to distinguish the species with certainty if their situation is not taken into consideration; but with local knowledge the tree on the high land is separable from the one in the valleys or on the flats.

Of course it is well-known that Forest Red Gum, in some situations, is scarcely distinguishable from *E. rostrata* (River Red Gum) except by the fruits; still field observation has satisfied

me that there is no gradation between these species, although they have strong affinities. Nor does there appear to be any between *E. rostrata* and *E. dealbata*, for in one instance, where a hill of Devonian sandstone comes down near the Lachlan River, I have collected *E. rostrata* on the river side and *E. dealbata* on the hill side of the road, about a chain apart, both being typical trees.

Messrs. Deane and Maiden (Proc. Linn. Soc. N.S.W. Vol. xxv. p. 466) have withdrawn specific rank from this species, and described it as a variety of *E. tereticornis*. The result of several years of close observation of these trees in the field has been to incline me to support their action.

Altogether the question of the relationship between *E. tereti-cornis* and *E. dealbata* seems a difficult one, and my object in offering the foregoing remarks is in order that they may be considered in any future investigation regarding the western Eucalypts.

Another tree now appearing for the first time is Casuarina quadrivalvis (She Oak and Mountain Oak). In the west this species appears on most of the igneous hills, and seems to prefer them, though it is not restricted to the one formation. Being much in demand as fodder for stock, the continued dry seasons have had the effect of causing this tree to be almost exterminated from some of the hills. It differs from the other Casuarinas of the west in its pendulous foliage and very large cones.

Amongst others noticed in passing along were :-

Acacia doratoxylon, which, with very few exceptions, grows on hills, though it does not discriminate between geological formations; it is one of those Acacias that has its flowers arranged in spikes, and not the usual capitula or flower-heads.

- A. homalophylla, which likes a stiff soil on flats.
- A. decora, often called Silver Wattle, although it has not the feather leaf usually associated with the term of Wattle. This species prefers slightly elevated land, and in the month of September has a profusion of beautiful "Wattle" blossoms.

In addition to the foregoing were—Acacia Oswaldi, A. hakeoides, Cassia eremophila, Canthium oleifolium, Dodonæa viscosa, var. attennata, Heterodendron oleæfolium, and also an Acacia which, from herbarium specimens, seems to be A. dealbata, Link, though I observed it over a distance of at least 200 miles, and never associated it with that species. It is a small tree, ranging from about 6 to 8 feet high, with a diameter from 4 to 6 inches. Its foliage is the usual feather leaves of the "Wattle," but these are green, and scarcely ever have that glaucous appearance so well known on the Silver Wattle (A. dealbata) of the cold highlands. Still I noticed this feature in a slight degree towards the Murrumbidgee, but never north of the Lachlan. From its colour it looks more like a dwarf form of A. decurrens. It has an extensive range, as will be seen from my notes which follow, where it will be referred to as A. dealbata (green variety).

Next in order were—Eucalyptus viridis, E. oleosa, E. dumosa, Casuarina Cambagei, Bertya Cunninghamii, and Acacia colletioides.

At about a dozen miles from Mount Boppy another Eucalypt is added to the list. This is E. Woollsiana, Baker, a box tree with clean greyish-white limbs, and generally an erect useful trunk. This species is perhaps more plentifully distributed in the western district than any other Eucalypt, and in places grows up to 100 feet high, with a diameter from 3 to 4 feet. From general appearance its greatest affinity seems to be with E. hemiphloia, but the fruits and leaves of that tree are larger. Yet, in coming easterly from Nymagee, the fruits of E. Woollsiana become larger and the leaves broader, especially in young trees, and at times almost sufficiently so to cause confusion with E. hemiphloia. It has various local names, one of the commonest being White Box, but in places along its western area, chiefly between Nyngan and Nymagee, where it grows near mallee, it is often called Mallee Box, from an erroneous impression that in its young stage it is a mallee. By the casual observer, it is sometimes confused with the large form of E. viridis, which is also in places called Mallee Box, but with this tree it has no field affinities.

tree which is best known in the western district as White Box is E. albens, with pale bark and glaucous leaves, but its habitat is under the western fringe of the high mountain spurs running from the Great Dividing Range, avoiding the cold country, and extending westward along slight undulations to the low plain country proper. Here it ceases, but is met and overlapped by E. Woollsiana. All along, and near these points of contact, the latter is called Black Box, to distinguish it from E. albens. It is also a darker tree, having dark green and slightly glossy leaves. In times of drought sheep will eat the leaves of E. albens, especially after they have been cut a day or two, but they object to the leaves of E. Woollsiana. This species grows on all formations, whether igneous or sedimentary, but is seldom or perhaps never found on the tops of high hills. It is, however, very partial to low ridges, and also grows plentifully on low land. Though it is to be found on the banks of the Lachlan, it is not, on a typical black soil river flat, so much in its regular habitat there as E. microtheca or E. largiflorens.

After passing Acacia homolophylla—some with broad and some with narrow leaves—A. doratoxylon, Eucalyptus tereticornis var. dealbata, Pittosporum phillyreoides, Fusanus acuminatus, and Acacia decora, a low slate ridge is reached where there is much Mallee—E. oleosa, E. dumosa, and E. viridis.

Next to be noticed is another Eucalypt now seen on this road for the first time, E. sideroxylon, A. Cunn., (Ironbark). This is the common Ironbark of the interior, and chiefly belongs there, although it occurs near the coast as at Liverpool, St. Mary's,&c. It is rarely found growing at an altitude exceeding 2000 feet above sea level. By some it is called Black and by others Red Ironbark owing to the colour of the bark and wood respectively. The aboriginal name is Mugga. In going west it is first met with on the western line beyond Kerr's Creek, and on the Orange to Forbes line beyond Molong, so that it covers much the same country as E. dealbata, and also prefers ridges. In the west this species bears a profusion of blossoms in the months of April and May. The flowers are generally creamy-white, but on some trees they are

red. It is fairly plentiful between the Macquarie and Murrumbidgee Rivers, occurring in patches, and shows a decided preference for a sedimentary formation. The timber is used freely for railway sleepers, and although it is considered one of the finest woods of the west, it is not to be compared for general use with *E. paniculata*, Sm., the Grey or White Ironbark of the coast. The wood of the latter tree is tough, while that of the western one is comparatively dry and brittle.

In view of the prominence given to the question of hybridization of Eucalypts by Messrs. Deane and Maiden in the Proc. Linn. Society, Vol. xxv. p. 111, where they deal with E. affinis which grows among E. sideroxylon and E. albens, also with another tree growing among E. siderophloia and E. hemiphloia at Homebush and Liverpool, it occurred to me that if cross-fertilization exists between the above trees, the same sort of thing may take place in other species, notably between E. sideroxylon and the western box tree recently described by Mr. R. T. Baker as E. Woollsiana. Knowing that I should meet with these two species growing together in several places, I decided to make diligent search for trees which would answer the required conditions of hybrids. After coming into the Ironbarks and Box a few hundred yards, three trees were found which seem intermediate in every respect between E. sideroxylon and E. Woollsiana both in the colour and texture of the bark and wood, as well as in the size of the fruits, which are larger than those of E. Woollsiana, but smaller than those of E. sideroxylon. This doubtful-looking tree was found again several times before reaching the Lachlan, but never in great numbers, and invariably associated with the same two These are points of circumstantial evidence which suggest hybridization. There is one feature in which this tree more nearly resembles the Ironbark than the Box, and it is in regard to the colour of the sap, which is a yellowish-green similar to the Ironbark, while that of the Box is white. In general appearance the tree is much like E. affinis, Deane and Maiden, but the fruits separate them. It is also like the doubtful tree at Liverpool.

The chief flowering time of *E. sideroxylon* in the west is about April and May, but flowers can generally be found before and after those months. I have seen it flowering at Cabramatta in January and July. *E. Woollsiana* flowers about February and March, but flowers of this species have been collected in May in the same locality as that in which *E. sideroxylon* was then flowering. I am not able to state the flowering time of the tree which looks half Box and half Ironbark, for though a very few flowers were collected in June, buds were found in September which seemed to indicate that the trees would be flowering in October. The scarcity of the tree makes it difficult to arrive at a definite conclusion in the matter.

It is no part of my purpose to try and prove that the tree in question is a hybrid, but simply to offer observations which may assist in settling the question. I have handed specimens to Mr. Deane, who will probably investigate this species.

About 7 miles west of Trowell Creek House is a quantity of Acacia trees up to 25 and 30 feet high, chiefly long stems, with a diameter of about 4 inches. Leaves are slightly silvery and somewhat resemble those of Heterodendron oleafolium. They are growing on scrubby sedimentary formation in company with Phebalium glandulosum and a Leptospermum. Only flowers in a very young state were procurable in May. These were arranged in racemes. The tree was not seen again, and I have not been able to identify the species.

Going on past Trowell Creek Homestead to the Nyngan Road there are, Eucalyptus intertexta, E. populifolia, Myoporum deserti, Phebalium glandulosum (a shrub), Geijera parviflora, Eremophila Mitchelli, E. longifolia, Canthium oleifolium, Acacia hakeoides, A. colletioides, A. homalophylla, Eucalyptus oleosa, E. viridis, Heterodendron oleæfolium, and Hakea leucoptera.

Crossing the Nyngan to Nymagee Road, at a point about 36 miles from Nyngan, and going to Honeybugle Station, a distance of about 20 miles easterly, the following are noticed:—Callitris robusta, Capparis Mitchelli, Sterculia diversifolia, Eucalyptus oleosa, E. dumosa, E. viridis, E. populifolia, E. intertexta (but

not so plentiful as formerly, as the eastern margin of its habitat between the Bogan and Lachlan is now nearly reached), E. Woollsiana, Casuarina Cambagei, Fusanus acuminatus, Acacia homalophylla, A. decora, A. colletioides, A. doratoxylon, A. Oswaldi, A. dealbata (green variety), Geijera parviflora, Heterodendron oleæfolium, Eremophila Mitchelli, E. longifolia, and Hakea leucoptera.

For the last 50 miles no trees were seen of Acacia aneura or A. excelsa, but both were found, in limited quantity, growing a few miles north of Honeybugle homestead, near an old copper mine in which were found some very good specimens of hornblendic rock.

Going easterly from Honeybugle homestead to Mudall on the Bogan River, a distance of about 16 miles, amongstother trees passed in driving along, were Callitris robusta, Eremophila Mitchelli, E. longifolia, Heterodendron oleæfolium, Eucalyptus populifolia (Bimble Box, sometimes spelt Bimbli; I understand that Bimble is the aboriginal name for this tree), Sterculia diversifolia, Eucalyptus intertexta, Geijera parviflora, Canthium oleifolium, Apophyllum anomalum, Acacia excelsa (some very good trees for two or three miles), A. Osvaldi, A. doratoxylon, A. decora, A. homalophylla, Cappuris Mitchelli, Hakea leucoptera, Myoporum deserti, Fusanus acuminatus.

At about half-way the first of the river black soil is reached, which suggests that we are approaching the Bogan. With the change of formation Eucalyptus largiflorens, F.v.M., (River Box), re-appears, having been last seen on the Darling River country south of Bourke (vide Part i.). Its drooping pale foliage at once catches the eye, and appears different from anything seen back from the rivers. The colour of the bark of this tree is the usual grey of most of the Box species, but the young trunks of a less diameter, that about 9 inches, show a decided blackening of the outer layers of the bark.

Here is also found Acacia pendula, A. Cunn., (Myall or Boree), the first seen along the country described in this paper. This species always grows on what is known as "black soil" (the

dread of the coach-driver in wet weather), though it may be many miles back from the river. For years I have been trying to work out the question whether Myall and Boree referred to one or two trees. Both names are used variously throughout the western division of New South Wales, though generally certain districts keep to the one name. In some cases Acacia homalophylla is locally called Yarran or Myall, while A. pendula is known as Boree; or A. homalophylla is called Yarran, A. pendula Boree, and A. salicina, Lindl., Myall, which is quite wrong. These mistakes often arise through people being indifferent as to proper local names. Generally A. homalophylla is known as Yarran, and A. pendula as either Myall or Boree, or sometimes as both. My conclusion is that Myall is the name usually given in localities north of the Bogan and extending into Queensland, and is possibly the aboriginal name given by some northern tribe; while Boree is the tribal name of the aborigines (approximately) south of the Lachlan River; and that both refer to the same tree. Many and varied have been the replies to my questions when trying to get at the truth of this matter, and quite recently I was told in all seriousness that there is a difference between Myall and Boree; but so slight that no white man can tell what it is. The wood of A. pendula is much sought after owing to its fragrance, but in this feature it has a strong rival in A. homalophylla, though for strength and durability Myall is superior. It is a splendid fodder tree, but is fast being exterminated, as all the young plants are browsed down by sheep and cattle. Horses, however, seem to spare them, as small trees are quite common in paddocks not accessible to sheep and cattle. In fact, almost the only places now in which young Myalls can be seen are horse paddocks and within the railway fences.

In speaking of Gidgea in a former paper (Part i.), it was mentioned that the leaves of that tree would not snap if doubled up while green, but that the leaves of A. homalophylla (Yarran) would. It may here be mentioned that the leaves of A. pendula (Myall) snap just as readily as those of Yarran under similar conditions, and are very like them in texture. Still the consti-

tuent parts must be different, as stock much prefer Myall to Yarran, and it is not at all rare to find a young plant of the latter.

Passing along towards the Bogan the following were noticed:— Geijera parviflora, Casuarina Cambagei, Hakea leucoptera, Heterodendron oleæfolium, Pittosporum phillyræoides, Acacia colletioides, Eucalyptus populifolia, E. largiflorens, Eremophila Mitchelli, E. maculata, F.v.M., (Native Fuchsia).

On the banks of the Bogan River at this point are Eucalyptus rostrata (River Red Gum), also Casuarina Cambagei (Belah), which from its situation might very easily be mistaken for C. Cunninghamiana, Miq., (River Oak), but from observations made at different points, there seems to be no River Oak growing on any part of the Bogan, though it is to be found on the upper portions of probably every other western river.

From Cobar to Mudall by the road travelled is about 120 miles, and 12 different species of Eucalypts were noticed:—E. intertexta, E. populifolia, E. viridis, E. oleosa, E. dumosa, E. Morrisii, E. tereticornis, var. dealbata, (E. dealbata, A. Cunn.), E. Woollsiana, E. sideroxylon, E. largiflorens, E. rostrata, and the Ironbark Box.

The species of Casuarina were—C. Cambagei, and C. quadrivalvis.

The Acacias were—A. excelsa, A. aneura, A. homalophylla, A. doratoxylon, A. Oswaldi, A. hakeoides, A. decora, A. colletioides, A. Burkittii, A. dealbata (green variety), A. pendula, and A. sp.

## EXPLANATION OF PLATE XL., FIG. 4.

Fig. 4.—Acacia Cambagei, Baker, referred to on pp. 594-596, and 719 as Gidgea, and described on p. 661; reproduced from a photograph.